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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/666,478

09/19/2003

Wolfgang Schmid

5367-41

8862

27799

7590

02/28/2006

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EXAMINER

NGUYEN, PHILLIP

ART UNIT

PAPER NUMBER

2828

DATE MAILED: 02/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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<b>Office Action Summary</b>	<b>Application No.</b> 10/666,478	<b>Applicant(s)</b> SCHMID ET AL.	
	<b>Examiner</b> Phillip Nguyen	<b>Art Unit</b> 2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 December 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 1-18, 20 and 21 is/are rejected.
- 7) ☒ Claim(s) 19 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments filed 12/21/2005 have been fully considered but they are not persuasive.

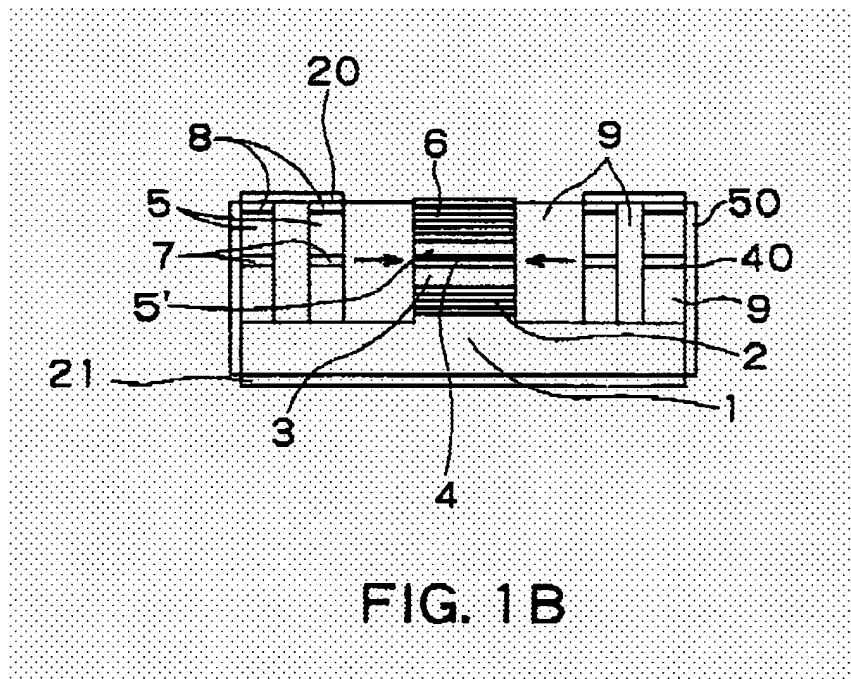
Applicant argues that Kinoshita teaches the pump laser has temperature that is higher than that of the vertical emitter due to the fact that there is no current flowing through the vertical emitter. However, claim 1 only recites at least one pump laser and a vertical emitter and the pump laser being monolithically integrated. Kinoshita discloses the exact same monolithically integrated laser structure with the pump laser being laterally integrated with the vertical emitter. Furthermore, in Fig. 1 of the current application, the vertical emitter does not have any electrode so that there is no current flowing through its active region to rise the temperature except for the optical pump from the pump laser. Since Kinoshita teaches the same structure, at least as claimed in claim 1, it is believed that the laser apparatus of Kinoshita would be inherent the result such that the temperature of the radiation emitting zone of the vertical emitter being higher than that of the pump laser. Therefore the rejection remains unchanged except for claim 19 as following:

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.



Claims 1-4, 6-18, and 20-21 are rejected under 35 U.S.C. 102(e) as being anticipated by Kinoshita ('537).

With respect to claim 1, Kinoshita discloses in Fig. 1B a semiconductor laser apparatus having a vertical emitter (1-6) and having at least one pump laser (on the sides) for optically

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pumping the vertical emitter with the vertical emitter and the pump laser being monolithically integrated. It is inherent that a radiation emitting zone of the pump laser produces less heat /lower temperature than that of the vertical emitter because the vertical emitter provide more powerful laser beam than that of the pump laser.

With respect to claim 2, Kinoshita discloses both pump laser and vertical emitter are epitaxially grown on a common substrate 1.

With respect to claims 3, Kinoshita discloses the pump laser and the vertical emitter being mounted on a common mount 1.

With respect to claims 4, since the distances between the mount to both active layers of the pump laser and vertical emitter are the same, the thermal resistances depend on the material between the active layers and the common mount. In this case, the material between the vertical emitter includes Bragg reflectors 2 and cladding layer 3. The material between the layer 7 and 21 includes insulating material 9 which has thermal resistance less than the Bragg reflectors and cladding.

With respect to claims 6 and 7, Kinoshita discloses the one or two or more mirror layers 2 are arranged between radiation-emitting zone (upward) and the mount 21 wherein the mirror layers are Bragg mirror.

With respect to claim 8, Kinoshita discloses pump laser has an active layer 7, comprising active zone and the vertical emitter has an active layer 4 comprising its active zone with active layer of the pump laser and active layer of the vertical emitter having the same structure as shown in Fig. 1B.

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With respect to claims 9 and 14, Kinoshita also discloses “the active layer” of the pump laser and/or “the active layer” of the vertical emitter are/is formed as quantum well structure (col. 1, lines 29-31 and col. 4, line 53).

With respect to claims 10 and 15, Kinoshita discloses the active layers of both pump laser and vertical emitter are formed jointly.

With respect to claims 11 and 16, Kinoshita discloses the radiation-emitting zone (as shown by the arrows) which is perpendicular to the direction of the main emission of the vertical emitter (for this case, it is upward direction).

With respect to claims 12 and 17, since the pump laser is formed on the edge and produces laser from its edge (shown by arrows), it is formed as an edge emitter.

With respect to claims 13, 18 and 20-21, Kinoshita discloses the vertical emitter is formed as VCSEL (see the entire reference).

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kinoshita (‘537) in view of Martinsen (539). Kinoshita discloses the claimed invention except for the pump laser and vertical emitter being arranged between the substrate and the mount. Martinsen discloses in

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Fig. 1 a laser device including a vertical emitter being arranged between a substrate 11 and a mount 23 (heat sink). For the improvement of the laser device, it would have been obvious to the one having ordinary skill in the art at the time the invention was made to arrange the pump laser and the vertical emitter disclosed by Kinoshita between the substrate and the mount as taught by Martinsen in order to obtain a lower thermal resistance between the vertical emitter and the heat sink.

#### ***Allowable Subject Matter***

4. Claim 19 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### ***Conclusion***

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

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CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

***Communication Information***


6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phillip Nguyen whose telephone number is 571-272-1947. The examiner can normally be reached on 9:00 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MINSUN HARVEY, can be reached on 571-272-1835. The fax phone number for the organization where this application or proceeding is assigned is **571-273-8300**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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JAMES  
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